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PREPARTUM MILKING of Dairy Cows

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Summary and Conclusions

More than 100 dairy animals were prepartum milked beginning two weeks before their expected calving date and compared with an equal number of control animals not so milked. Typical secretions of both prepartum and postpartum milk were analyzed.

Some animals failed to respond to prepartum milking, never producing an appreciable amount of milk before parturition. Others responded by producing varying amounts—a few more than 30 pounds on the day preceding the birth of the calf. Production of prepartum cows was similar to that of the control animals. Animals producing the large amounts of milk preceding calving produced considerably more milk during their lactation than did those producing small amounts prepartum, but variation within these groups was large. Peak production for both lots was reached during the fifth week. Production curves for full lactation for both lots are similar.

Prepartum milking was found to have no effect on the incidence of milk fever or on the length of gestation. A statistically significant increase in retained placenta occurred in the prepartum lot, and the higher the prepartum production, the greater was the incidence of this trouble. The animals producing 20 pounds of milk or more on the day before parturition were much more likely to retain their placenta than those which did not respond to such milking.

Cows which were prepartum milked also had more swelling and congestion of the udder and lymphatic edema than did the control cows. The difference was not statistically significant.

The composition of colostrum and early milk from prepartum and non-prepartum animals was determined. Ascorbic acid, riboflavin, and vitamin A showed a decrease throughout the prepartum period of milking, although in some cases the vitamin A concentration showed a rise at the time of calving. However, in general, the colostral quality of the secretion was gradually lost as the amount of prepartum milk increased. If a cow was producing 20 pounds or more on the day preceding parturition (or a total of approximately 80 pounds or more) the milk was apparently normal at the time the calf was born.

No differences were apparent between the calves of the prepartum-milked cows and the controls, as indicated by birth weight, rate of growth, as measured by height at withers and weight, frequency or persistency of scours, hair coat, or vitality.

Although the practice of prepartum milking seems to do no harm either to the cow or her calf, it seems to offer little to justify the time and labor involved.

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Prepartum Milking of Dairy Cows

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Introduction

THE udders of many dairy heifers and cows become badly swollen and congested several days preceding parturition. Lymphatic edema, especially in front of the udder, frequently occurs in first-calf heifers and sometimes in older animals. This edema may not completely disappear for two weeks or more after calving.

This congested condition makes it undesirable to put these animals on full feed to bring them into full production until the swelling has subsided. Sometimes the udder becomes so distended that it is feared the gland may be injured permanently. Because of this, dairymen frequently are concerned about the advisability of milking such animals before parturition. Some dairymen, seeking to relieve this congestion, milked some or all of their cows several days to two weeks before they were due to calve, and their results have begun to appear in the literature. Many of the reports were favorable and some dairymen were quite enthusiastic about the prepartum milking of dairy cows.

In order to determine whether prepartum milking of dairy cows should be advocated, the West Virginia University Agricultural Experiment Station undertook a study to determine its effect on the cow and her calf and on the composition of the milk.

Review of Literature

Until the latest editions, some college texts on dairying advised against prepartum milking. Eckles *et al.* (9) states, "Milking before the birth of the calf should seldom, if ever, be practiced. . . Milking previous to the birth of the calf tends to delay the onset of parturition on account of the close relation between the nerves of the udder and of the reproductive organs. Sometimes, as a result of milking, parturition may be delayed a week or more and when it does come the contractions of the uterus which expel the fetus are weaker than normal, resulting in more trouble in the delivery of the calf."

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Davis and Trimberger (5) reported great reduction of the swelling, inflamation, and physical strain on the udder by milking before parturition. They noted some loss of calves which they attributed to the smaller amount of colostrum available.

Turner (24) stated that prepartum milking for a period of about ten days had certain advantages. He reported that in all cases when cows were milked prepartum the udders became soft and pliable, and that the colostral character of the secretion largely disappeared and the globulin content was reduced to that of normal milk by time of parturition. The lack of colostrum increased the difficulty of raising the progeny, which seemed much more susceptible to Bacillus coli infection. Various investigators (6, 8, 10, 24) have found that prepartum milking resulted in secretion which resembles normal milk in its composition at the time of the calf's birth.

Keyes and associates (15) milked a total of 25 cows from two to sixteen days before parturition. Samples were taken from each quarter at all milkings before freshening and for at least four days after the birth of the calf. Milk production started at about a pound a day but increased at the rate of more than two pounds per day up to the third day before calving, at which time it increased at the rate of five or six pounds a day. An average of 25 pounds of milk was produced on the the day of calving, and this increased to 42 pounds on the fourth day after calving.

The relatively high concentrations of carotene and vitamin A in colostrum milk, as compared with that of normal milk, is well known. Less information is available on other vitamins, particularly ascorbic acid and the B vitamins. Pearson and Darnell (18) reported values for thiamin, riboflavin, nicotinic acid, and pantothenic acid in colostrum and in normal milk. They found the amount of thiamin and riboflavin higher and the amount of pantothenic acid lower in colostrum than in normal milk, but there was no significant difference in the amount of nicotinic acid in the two milks. Rasmussen *et al.* (19) and Kon and Watson (16) found that the ascorbic acid content of colostrum was higher than that of milk produced a few days later. Holmes and associates (14) reported that the ascorbic acid content of the milk from Guernsey and Holstein cows rose rapidly from the first to the second month of lactation. Holmes and Lindquist (13) found that mares' colostrum was relatively low in ascorbic acid but increased fairly steadily from the first to the sixteenth day of lactation.

Eaton *et al.* (6) observed that the first milking postpartum from prepartum-milked cows was very similar in composition to normal milk, especially in those cows milked for at least ten days before calving.

They also reported that the first milk after calving from postpartum-milked cows contained approximately five times as much carotene and vitamin A as the first milk obtained from the prepartum-milked cows following calving. It was expected that the vitamin content might be affected by the amount of prepartum milk secreted as was reported by VanLandingham *et al.* (26) in the case of total nitrogen and non-casein nitrogen.

Sutton, Kaeser, and Soldner (23) have also done considerable work on the blood plasma levels of vitamin A and carotene in the dairy cow at the time of parturition. They were of the opinion that the secretion of colostrum drains carotene and vitamin A from the circulating blood. The magnitude of the decrease in blood plasma carotene and vitamin A seemed to depend in part, at least, upon the rate of secretion rather than the total output during the colostrum period. In animals in which there was considerable congestion in the udder, the percentage decrease in blood plasma was less than in those with little udder congestion. With animals that milked out well from the start the carotene and vitamin A of the colostrum fell off sharply for the first three days and closely approached that of normal milk on the third day. The effect of prepartum milking on other vitamins has not been reported.

Several workers have reported on the calcium, inorganic phosphorus, and magnesium content of the blood of dairy cows before and after parturition, and that of the calf during early life (1, 11, 20, 27).

A number of workers have suggested that prepartum milking might reduce the incidence of milk fever (3, 5, 6, 17). However, Smith and Blosser (22) found no significant reduction in the incidence of milk fever due to prepartum milking.

Procedure

The animals used in this study were from the West Virginia University dairy herd, upon which complete records of health, production, and reproductive performance have been kept for many years. The herd is milked twice daily. Production records in this report are figured on a Mature Equivalent basis.

More than 100 cows were prepartum milked, and an equal number not milked until parturition had occurred served as controls. The control lot also included several animals scheduled for prepartum milking which calved normally before prepartum milking was started. The records of several animals milked less than four days prepartum were not included.

Three breeds, Ayrshire, Holstein, and Jersey were included in the study. The cows were divided into two comparable lots by placing every other animal of each breed, based upon the calculated calving date, into

a control and an experimental group. The control group was milked in the usual way after freshening. The first year the animals in the experimental lot were prepartum milked beginning ten days before they were expected to calve. However, because several animals calved before they had been prepartum milked for the desired period prior to calving, prepartum milking was later started fourteen days before the calf was due. The cows were machine milked once each day until production reached five pounds, after which time the cows were milked twice daily.

The condition of the udder and the degree of lymphatic edema were observed and evaluated daily for each animal from the time the udder started to fill until it became normal following parturition.

Sixteen first-calf heifers were used to study the composition of colostrum milk. When prepartum production in these heifers reached two pounds per day samples were taken for analysis. After parturition the heifers were milked twice daily and the calves were permitted to remain with the dams for the first three days, as was the usual practice. This phase of the study has been reported earlier (26).

The study of the vitamin content of colostrum and early milk included six prepartum and two typical non-prepartum-milked cows. Samples from the prepartum-milked cows were taken for anlaysis as soon as their production reached two pounds per day. After parturition the calves were removed from the dam at once so that accurate samples and records of production could be obtained. Nitrogen was determined by the Kjeldahl method. Vitamin A and total carotenoid pigments were determined by the method of Boyer *et al.* (4). The flourometric method of Hand (12) for determining riboflavin was modified so as to use 5 ml. of milk added to acetone in a volumetric flash and the mixture diluted to the mark by the addition of acetone. Calibration curves were made for dilutions of both 200 and 300 ml.

Ascorbic acid was determined by titration with a dye solution of sodium 2,6 dichlorophenolindophenol. The freshly prepared dye solution was standardized against pure cyrstalline ascorbic acid. To 21.36 ml. of a freshly prepared 5 per cent metaphosphoric acid solution, 20 ml. of milk were added while a flask was shaken with a swirling motion. After about five to ten minutes the mixture was filtered into a dry flask and a 10 ml. portion of the filtrate titrated represented the ascorbic acid in 5 ml. of milk. With the first few samples of prepartum milk considerable difficulty was experienced in securing a clear filtrate. This difficulty was overcome by adding 10 ml. of milk to 5 per cent metaphosphoric acid in a 50-ml. sugar flask diluting to volume with additional acid and allowing the mixture to stand ten minutes before filtering.

The calves from both lots were fed and managed similarly except that those from the prepartum cows were given extra cod liver oil during the first month. All calves were removed from their dams on the third day after calving except when the composition of colostrum was studied. A limited amount of whole milk was fed for eight weeks. Mixed hay of good quality and a commercial calf starter were available at all times. Observations were recorded as to scours, hair condition, and vitality, and weekly weight and height at withers were taken on each individual until each calf was six months old.

Results

VARIATION IN AMOUNT OF PREPARTUM SECRETION

Wide differences occurred in the amount of prepartum milk secreted by different animals. Some failed to produce any appreciable amount of milk until after parturition even though they were "milked" for more than two weeks before calving. Others produced a steadily increasing amount so that on the day before freshening a few produced more than 30 pounds of prepartum milk.

The animals milked prepartum were divided into four sublots based on their production on the day before parturition. Table 1 shows the number and percentage of the animals of each breed in each sublot.

It will be noted that the Ayrshires and Holsteins show a reasonable uniformity in their prepartum production pattern, but only two Jerseys produced as much as two pounds on the day before calving. Inasmuch as the Jerseys in this herd failed to respond to prepartum milking, they were omitted from parts of this report.

EFFECT OF PREPARTUM MILKING ON TOTAL MILK PRODUCTION

When the milk production of the prepartum-milked Ayrshires was compared with the controls it was found to be very nearly equal. During the first 26 weeks—the period during which differences in time of conception would have little effect—the milk production of the prepartum group averaged 43 pounds more than the controls. Over the 43-week period the prepartum group produced an average of 169 pounds more than the control group, as shown in Table 2.

The table also shows that as the prepartum milk production of the Ayrshires increased, the milk produced during the lactation period also increased. The 14 cows which produced 20 pounds or more prepartum on the day before parturition produced an average of 1,560 pounds more milk during the 43-week lactation period than the 22 animals

Table 1. Number and Percentage of Prepartum Animals of Each Breed Arranged on the Basis of Production on the Day Preceding Calving

Prepartum Production on Day Preceding Calving	Breed							
	Ayrshires		Holsteins		Jerseys		All Breeds	
	No.	%	No.	%	No.	%	No.	%
Under 2 lbs.	24	35.8	5	23.8	14	87.5	43	41.3
2-10 lbs.	12	17.9	8	38.1	2	12.5	22	21.2
10-20 lbs.	16	23.1	3	14.3	0	0	19	18.1
Over 20 lbs.	15	22.4	5	23.8	0	0	20	19.4
Total	67	100.0	21	100.0	16	100.0	104	100.0
Controls	94		19		27		140	

Table 2. Average Milk Production of Control and Prepartum Animals for a 26- and 43-Week Period

Prepartum Production on Day Preceding Calving (lbs. milk)	Number of Animals and Production					
	26 Weeks			43 Weeks		
	No. of Animals	Av. Production	No. of Animals	Difference	Av. Production	Difference
Ayrshires		*lbs.*	*lbs.*		*lbs.*	*lbs.*
Controls	89	7077	.....	85	9520	.....
Prepartum-milked						
Under 2	22	6582	—495	22	8866	—655
2-10	12	7165	+ 88	10	9747	+226
10-20	13	7436	+359	11	10482	+961
20 or more	14	7632	+555	12	10425	+905
All prepartum	61	7120	+ 43	55	9689	+169
Holsteins						
Controls	17	9385	.....	17	12751	.....
Prepartum-milked						
Under 2	5	9641	+256	5	12957	+205
2-10	7	9091	—294	7	13055	+304
10-20	3	9243	—141	3	12167	—585
20 or more	5	9648	+264	5	13243	+493
All prepartum	20	9391	+ 6	20	12944	+193

which did not respond to prepartum milking. There was, however, a wide variation in the milk production of the individual animals within each group.

The limited number of Holsteins showed somewhat the same general trend as the Ayrshires.

TIME TO REACH PEAK PRODUCTION

The prepartum and control lots both reached their highest milk production during the fifth week of lactation. The prepartum animals, however, increased at a slightly faster rate than the control animals. The peak production was the highest average daily production figured on a weekly basis. The decline in production was very similar for all animals.

RETENTION OF PLACENTA

The prepartum group had a statistically significant ($P < .05$) increase in number of retained placentas than had the control group. Retention of placentas occurred twice as frequently in the prepartum group as in the control group (Table 3). Furthermore, as the amount of prepartum milk increased (Table 4), the number of retained placentas increased. Animals producing 20 pounds or more on the day previous to parturition were five times as likely to retain their placentas as were those which produced two pounds or less. First-calf heifers had somewhat less trouble than the older cows. In spite of the somewhat higher incidence of retained placentas, there was little difference in the conception rate of the two groups for the following gestation, as 72.6 per cent of the control group and 71.6 per cent of the prepartum group calved within 400 days of their previous freshening date.

INCIDENCE OF MILK FEVER

Table 5 shows that six of 102 prepartum animals and nine of 145 control animals were treated for milk fever. On a percentage basis, this indicates that the practice of prepartum milking has no effect on the incidence of milk fever. No first-calf heifers, and only one cow having her second calf, were treated.

Table 3. Number and Percentage of Control and Prepartum Animals Retaining Their Placentas

Group	Total No. of Animals	1st Calf		2nd Calf		3rd Calf		Average	
		No. of Animals	%	No. of Animals	%	No. of Animals	%	No. of Animals	%
Ayrshires									
Controls	99	4	10	2	7	7	23	13	13
Prepartum	66	3	11	4	36	9	39	16	24
Holsteins									
Controls	19	0	0	0	0	0	0	0	0
Prepartum	20	0	0	1	25	1	11	2	10
Jerseys									
Controls	27	0	0	0	0	0	0	0	0
Prepartum	16	0	0	0	0	0	0	0	0
All Breeds									
Controls	145		7		5		15		9
Prepartum	102		7		31		23		18

Analysis of Variance for Table 3

Source of Variation	Degree of Freedom	Sums of Squares	Mean Square	F
Breed	2	1.349	.674	6.48
Treatment	1	.492	.492	4.73
Error	243	25.310	.104	

Table 4. Number and Percentage of Prepartum Animals Retaining Placentas, Arranged by Production on the Day Before Calving

Prepartum Production Day Before Calving (All Breeds)	Number of Animals	Retained Placenta	Retained Placenta
Lbs. Milk		*Number*	*Per cent*
0-2	43	3	7
2-10	21	4	19
10-20	19	4	21
20 or more	19	7	37

Analysis of Variance for Table 4

Source of Variation	Degree of Freedom	Sums of Squares	Mean Square	F
Total	101	18		
Among classes	3	4.392	1.464	10.608
Error	98	13.608	.139	

Table 5. Number of Prepartum and Control Animals Treated for Milk Fever

Group	Prepartum		Control	
	Number	Milk Fever	Number	Milk Fever
Ayrshires				
1st calf	32	0	41	0
2nd calf	11	0	27	0
3rd calf and later	23	2	31	6
All Ayrshires	66	2	99	6
Holsteins				
1st calf	7	0	7	0
2rd calf	4	0	7	0
3rd calf	9	2	5	0
All Holsteins	20	2	19	0
Jerseys				
All Jerseys	27	3	16	2
1st calf	10	0	4	0
2nd calf	6	1	1	0
3rd calf and later	11	2	11	2
All Jerseys	27	3	16	2
All Breeds				
1st calf	43	0	58	0
2nd calf	16	0	40	1
3rd calf and later	43	6	47	8
All breeds	102	6	145	9

LENGTH OF GESTATION

The lengths of gestation for the different breeds and groups are given in Table 6. The data show no difference between the groups.

Table 6. Average Length of Gestation Period of Prepartum and Control Animals

Period	Ayrshires		Holsteins		Jerseys		All Breeds	
	No. of Animals	Average Days	No. of Animals	Average Days	No. of Animals	Average Days	No. of Animals	Average Days
Controls								
1st calf	26	279.8	7	279.4	8	274.4	41	278.1
2nd calf	16	281.3	4	280.1	6	271.3	26	278.8
3rd calf and later	20	281.1	4	277.7	8	272.6	32	278.5
All	62	280.6	15	279.8	22	272.9	99	278.4
Prepartum								
1st calf	25	278.9	9	281.1	5	273.8	39	278.8
2nd calf	12	279.6	4	281.7	3	271.7	19	278.0
3rd calf and later	19	280.6	6	277.2	13	276.2	38	278.8
All	56	279.6	19	280.4	21	275.0	96	278.6
Difference		—1.0		+.6		+2.1		+.2

UDDER CONGESTION

One of the main reasons advanced in favor of prepartum milking was that it reduced udder congestion at calving time. In this study the udder of each animal was carefully watched and its condition recorded each day from the time it started to fill until it became normal following parturition.

Table 7 gives a summary of the observations on udder congestion. There was more congestion in the prepartum-milked animals, but because of the variation within lots and between lactations of the same cow, this difference was not statistically significant.

The length of time it took for the udder to return to normal was slightly longer for the prepartum-milked cows than for the control animals. The incidence of lymphatic edema in front of the udder, although less frequent than udder congestion, showed the same pattern. Under the conditions of this experiment, prepartum milking did not reduce the amount of congestion nor the length of time required for the udder to become normal following calving.

EFFECT OF PREPARTUM MILKING ON THE NITROGEN AND VITAMIN CONTENT OF COLOSTRUM AND EARLY MILK

Nitrogen

The total nitrogen content of the secretion of both the prepartum and non-prepartum groups decreased rapidly at the beginning and then tended to level off. The milk of the cows which had produced the most prepartum secretion showed a nitrogen content very close to that of normal milk at the time of parturition.

Table 7. Amount of Udder Congestion of Control and Prepartum Animals*

Breed	Total No. of Animals	Udder Congestion							
		None		Slight		Medium		Great	
		No. of Animals	%	No. of Animals	%	No. of Animals	%	No. of Animals	%
Controls									
Ayrshire	70	36	51.4	24	34.3	7	10.0	3	4.3
Holstein	16	4	25.0	9	56.3	1	6.2	2	12.5
Jersey	27	14	51.9	8	29.6	5	18.5	0	.0
Total	113	54	47.8	41	36.3	13	11.5	5	4.4
Prepartum									
Ayrshire	61	18	29.5	21	34.5	14	23.0	8	13.0
Holstein	19	4	21.1	10	52.6	4	21.1	1	5.2
Jersey	25	16	64.0	5	20.0	3	12.0	1	4.0
Total	105	38	36.2	36	34.3	21	20.0	10	9.5

Analysis of Variance for Table 7

Source of Variance	Degrees of Freedom	Sums of Squares	Mean Square	F
Breed	2	9.441	4.720	.313
Treatment	1	9.158	9.158	.607
Error	214	3227.969	15.084	

*The amount of congestion of the udder was rated 0 to 5, depending upon the extent of congestion, when 0 indicated no congestion and 5 for extreme cases.

Ascorbic Acid

The ascorbic acid concentration, as shown in Table 8, indicates a gradual decrease throughout the entire prepartum period of milking which continued even after parturition. This decrease in ascorbic acid concentration after parturition was followed by a small increase after which the ascorbic acid content leveled off and remained fairly constant. The ascorbic acid content of the colostrum of the control animals decreased rapidly following parturition, and by the fourth day was not significantly different from the prepartum group.

Riboflavin

A rapid decrease in the concentration of riboflavin was apparent (Table 9) starting with the first milk samples analyzed. The decrease continued at a slower rate throughout the entire sampling period.

Vitamin A and Carotene

Changes in vitamin A and carotene, expressed as International Units of vitamin A, are shown in Table 10. The vitamin A content decreased from the day sampling started except for the day of calving,

Table 8. Ascorbic Acid mg/L

Cow No.	Days Prepartum						Days Postpartum				
	6	5	4	3	2	1	0	1	2	3	4
782A		12.0	18.2	25.7	19.2	7.1	6.9	4.4	6.6	11.0	
40H				28.2	14.8	10.3	6.4	1.7	2.8	3.5	5.3
36H	25.4	21.3	13.2	6.7	5.5	3.3	3.0	11.8	6.0	5.8	8.0
827A				29.4	32.3	27.2	15.2	3.0	5.3	4.7	
798A				3.8	3.2	2.8	1.8	1.4	2.0	1.9	
783A	11.2	15.7	19.7	17.1	14.7	12.7	4.4	3.4	3.7	3.2	6.8
Av.	18.3	16.3	17.0	18.5	15.0	10.6	6.3	4.3	4.4	5.0	6.7
38H	Not prepartum milked							15.2	10.0	4.9	2.2
757A	Not prepartum milked							15.9	11.3	14.3	12.7
Av.	Not prepartum milked							15.6	10.7	9.6	7.5

Table 9. Riboflavin mg/L

Cow No.	Days Prepartum						Days Postpartum				
	6	5	4	3	2	1	0	1	2	3	4
782A		7.08	7.28	5.85	4.84	4.66	4.96	33.0	1.88	1.94	
40H				12.00	4.86	3.70	1.74	1.41	1.35	1.20	
36H	9.50	7.04	2.80	1.86	1.80	2.28	1.43	1.58	1.94	1.81	1.00
827A				6.83	4.10	3.34	3.93	2.20	1.80	2.70	1.76
798A				8.37	7.62	4.98	3.22	2.73	3.48	3.00	
783A	6.10	4.35	3.74	3.16	1.96	2.05	1.44	1.62	2.42	2.32	2.32
Av.	8.80	6.19	4.37	6.33	4.20	3.50	2.79	2.45	2.15	2.16	1.69
38H	Not prepartum milked							7.46	1.88	1.64	1.22
757A	Not prepartum milked							3.63	3.73	2.05	1.14
Av.	Not prepartum milked							5.55	2.81	1.85	1.18

Table 10. Vitamin A. I.U./100 ml.

Cow No.	Days Prepartum						Days Postpartum				
	6	5	4	3	2	1	0	1	2	3	4
782A	386	254	196	300	103	125	228	63	66	25	
40H					475	307	165	77	59	50	50
36H	363	357	196	59	72	76	128	72	56	63	70
827A				652	189	475	405	259	150	144	
798A				146	460	86	552	149	212	162	
783A	492	508	430	324	262	173	163	57	34	45	30
Av.	414	373	274	288	260	207	257	113	96	82	50

which usually showed a higher value than the secretion on either the last day before parturition or the first milking after parturition. Either the last milk before freshening or the first milk following calving showed a large increase in vitamin A. If the high values were omitted in each case for the day of calving, the vitamin A content would average 197 I.U., as compared with 257 I.U. for the day of calving and fit the pattern of decreasing vitamin A content, as is shown by Table 10.

A comparison of the first samples analyzed prepartum, the first sample after calving, and the last sample analyzed postpartum is given on the next page for the six prepartum cows:

	Nitrogen mg/L	Ascorbic Acid mg/L	Riboflavin mg/L	Vitamin A I.U. 100 ml.
First samples analyzed prepartum	22.6	18.3	8.5	469
First sample after calving	8.1	4.3	2.4	300
Last sample analyzed postpartum	6.5	5.4	2.3	97

EFFECT OF PREPARTUM MILKING ON CALVES OF COWS PREPARTUM MILKED

The average birth weights of the lots are shown in Table 11. The birth weights for the two groups are about the same, as would be expected, since the length of gestation was approximately the same.

Table 11. Birth Weights of Female Calves of Prepartum and Control Animals

Breed	Controls		Prepartum	
	Number of Animals	Average Weight	Number of Animals	Average Weight
Ayrshires				
1st calf	26	64.9	15	68.8
2nd calf	14	72.9	8	70.8
3rd calf and later	22	77.0	11	74.3
All	62	70.9	34	71.0
Holsteins				
All	7	93.3	8	95.0
Jerseys				
All	11	53.3	8	54.4

Growth of Calves

The average weekly gain in weight of the calves from birth to six months for both the prepartum and control groups was similar. Calves from the prepartum lot grew fully as well as those from the control lot.

It is especially interesting to note that calves from prepartum dams which produced more than 20 pounds on the day preceding parturition also grew fully as well as the calves dropped by the control cows. It has been demonstrated that dams producing 20 pounds or more on the day before calving were producing normal milk for all constituents tested at the time of calving. It was expected that calves from this group would do poorly and have a high mortality rate, as they received no true colostrum milk.

In an effort to determine whether milk from these dams did contain something which had not been detected in its analysis, four calves were removed from their dams before they nursed and were placed at once on the regular herd milk. They received no colostrum and were fed no cod liver oil or other vitamin preparation, but were fed a commercial calf starter (not containing an antibiotic) and good mixed hay at will from the start. All four of these calves grew normally without digestive disorders or serious scours. This would indicate that, under favorable conditions, calves can be successfully raised without the use of colostrum.

General Health

Calves out of prepartum dams were fully as healthy, as measured by freedom from scours, smoothness of hair coat, and vitality, as calves of the control dams. In no category was the control lot superior to those of the prepartum lot.

Scours were not a serious problem with either lot. Cases which were observed were slight and of short duration.

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